A TAXONOMIC STUDY OF THE SOUTH AMERICAN GENUS *MEGALOPROCTUS* SCHULZ (HYMENOPTERA : BRACONIDAE : DORYCTINAE)

Paul M. Marsh
Systematic Entomology Laboratory, U.S.D.A.
Washington, D.C. 20560

The Neotropical Region is rich in species and genera of the braconid subfamily Doryctinae. However, as is the case for most of the Braconidae, the Doryctinae are largely unstudied and many genera and species are undescribed.

The South American genus *Megaloproctus* Schulz is one of the most strikingly colored and largest in size of the Western Hemisphere Doryctinae. The body length ranges from 8 to 20 mm and the ovipositor of some species reaches 30 mm. This long ovipositor would indicate a parasitic habit on hosts which bore deeply into wood or stems, but there are no biological records for any species in the genus.

Fischer (1980) reviewed the genus based on ten specimens in the Hungarian Natural History Museum, Budapest, and provided a key to seven species. In the present study, based on more than 200 specimens, I have described 13 species, five of which are new, and prepared keys to females and males.

Most the specimens for this study are from the collections of the U.S. National Museum of Natural History, Washington, D.C. and the British Museum (Natural History), London. Other specimens, including holotypes of several species, have been borrowed from the following collections: American Museum of Natural History, New York; California Academy of Sciences, San Francisco; Canadian National Collection, Ottawa; Carnegie Museum, Pittsburgh, Pennsylvania; Cornell University, Ithaca, New York; Fundacion Miguel Lillo, Tucuman, Argentina; Hungarian Natural History Museum, Budapest; Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; Natural History Museum, Paris; Polish Academy of Sciences, Warsaw; Rijksmuseum van Natuurlijke Historie, Leiden; Swedish Museum of Natural History, Stockholm. I express my appreciation to the individuals from each of these institutions who arranged for the loan of specimens.

Genus **MEGALOPROCTUS** Schulz

Megaproctus Brullé, 1846, p. 467. Preoccupied by Schoenherr, 1838.

Type-species: *Megaproctus didymus* Brullé, designated by Viereck, 1914.

Megaloproctus Schulz, 1906, p. 138. Emendation.

Megistoproctus Schulz, 1911, p. 88. New name for *Megaproctus* Brullé.

Prosthiacantha Enderlein, 1912, p. 24. Synonymy by Shenefelt and Marsh, 1976.

Type-species: *Prosthiacantha harpactorina* Enderlein. Monotypic.

Ectetamenochir Enderlein, 1912, p. 33. Synonymy by Roman, 1924.

Type-species: *Ectetamenochir crinicornis* Enderlein. Monotypic.

Schulz (1906) emended the name *Megaproctus* to *Megaloproctus*, but there is no indication that he was aware that *Megaproctus* was preoccupied. Later, Schulz (1911) proposed a new name, *Megistoproctus*, for *Megaproctus*

apparently without realizing that he had changed the name earlier. According to Articles 19 and 33a of the Code of Zoological Nomenclature, regardless of whether *Megaloproctus* was a justified or unjustified emendation, it is an available name.

Description: Moderate to large species, length of body 8-20 mm, length of ovipositor 5-30 mm; head cubical, occipital carina present, eyes large, malar space 1/3 eye height or less, face ruguose (Figs. 20-24), rest of head smooth, vertex occasionally strigate (Figs. 10, 12); thorax smooth, with limited amount of sculpturing, notauli impressed and weakly scrobiculate, propodeum nearly horizontal, without a distinct posterior declivity; abdomen long and narrow, usually smooth, second tergum always with a smooth, arcuate, transverse groove across middle; fore wing (Figs. 1-8) with three cubital cells, recurrent vein entering first cubital cell or interstitial with first intercubitus, first and second segments of mediella and basella of hind wing about equal in length, rarely first segment of mediella longer than second; legs long and slender, fore tibia with row of stout spines on anterior edge (Figs. 22, 26), hind coxa rounded ventrally at base, without a tooth; ovipositor at least as long as abdomen, often longer than entire body.

Distribution: Central and South America.

Biology: Unknown. The extremely long ovipositor suggests that species are possibly parasites of beetle larvae which bore deeply in wood.

Megaloproctus is related to *Ontsira* Cameron and *Doryctes* Haliday by wing venation but is distinguished by the hind coxa being rounded ventrally at the base and without a tooth. In habitus and coloration it is similar to *Binarea* Brulle but is easily distinguished by the presence of the occipital carina.

All terms for sculpturing are based on Harris, 1979.

KEY TO THE SPECIES

Females

1. Wings banded with alternate yellow and brown (Figs. 2, 4, 6, 8) . . . 2
   Wings not banded, completely infuscated, stigma occasionally yellow . . (Figs. 1, 3, 5, 7) 7

2. Ocell-ocular distance greater than length of lateral ocellus and equal to or greater than distance between lateral ocelli (Figs. 13, 14) 3
   Ocell-ocular distance equal to or less than length of lateral ocellus and always shorter than distance between lateral ocelli (Figs. 9, 10, 15) 5

3. Ovipositor longer than entire body; fore tarsus more than two times length of fore tibia . . . . . 2. *brasiliensis* (Szépligeti)
   Ovipositor slightly longer than abdomen; fore tarsus less than two times length of fore tibia 4

4. Radiellen cell of hind wing with weak cross vein; hind femur and tibia yellow; fore tibia with single row of stout spines along anterior edge . . . . . 7. *bifasciatus* (Szépligeti)

Radiellen cell without cross vein; hind femur and tibia black; fore tibia with double row of 9-13 stout spines (Fig. 26) . 4. *didymus* (Brullé)

5. Radiellen cell of hind wing without weak cross vein (Fig. 2) . . . . . 6. *harpactorinus* (Enderlein)
Radiellen cell with weak cross veig (Figs. 4, 6) 9

6. First abdominal tergum, at least laterally, and base of second longitudinally strigate-rugose (Fig. 17) . . . . . 10. *striatus*, n. sp.
Abdominal terga smooth . . . . . 9. *schunckei*, n. sp.

7. Body unicolorous, brown; stigma yellow (Figs. 1, 3) 8
At least mesothorax differently colored than head; stigma black or brown (Figs. 5, 7) 9

8. Vertex strigate between lateral ocelli (Fig. 12); apical antennal segments round, normal . . . . . 3. *castaneus* (Brullé)
Vertex smooth (Fig 11); apical antennal segments flattened . . . . . 8. *platyantennus*, n. sp.

9. Radiellen cell of hind wing divided by cross vein . . . . . 5. *fumipennis* (Szépligeti)
Radiellen cell without cross vein 10

10. Abdominal terga 1 and 2 strigate-rugose; thorax, abdomen, and hind coxa yellow-orange . . . . . 13. *xanthus* , n. sp.
Abdominal terga 1 and 2 smooth; thorax and abdomen at least partly black, hind coxa black 11

11. Abdomen entirely black; ovipositor longer than body; body length greater than 15 mm . . . . . 12. *townesi*, n. sp.
Abdomen partly orange, ovipositor shorter than body; body length less than 15 mm 12

12. Radial cell of fore wing nearly five times as long as greatest width (Fig. 5); radiellen cell of hind wing without curved infuscated spot at base; fore tarsus about two times as long as fore tibia . . . . . 11. *strongylogaster* (Cameron)
Radial cell not more than four times as long as width (Fig. 7); radiellen cell with curved infuscated spot at base; fore tarsus about 1-1/2 times as long as fore tibia . . . . . 7. *pertinax* (Cameron)

Males

The following key is not very reliable. As is often the case in the Braconidae, males are difficult to identify unless associated in rearings with females. I have seen no associated sexes and only a few male specimens, so the key is based on males that come closest to agreeing with the females.

1. Wings not banded, uniformly infuscated 2
Wings banded 5

2. Body unicolorous brown, stigma yellow 3
Body yellow or orange and black, stigma black 4

3. Vertex strigate between lateral ocelli . . . . . 3. *castaneus* (Brullé)
Vertex smooth . . . . . 8. *platyantennus*, n. sp.

4. Thorax and basal abdominal segments orange; head, most of legs, and apex of abdomen black . . . . . 5. *fumipennis* (Szépligeti)
Body entirely yellow . . . . . 7. *pertinax* (Cameron)

5. Ocell-ocular distance less than length of lateral ocellus 6
Ocell-ocular distance equal to or greater than length of lateral ocellus 7

6. Vertex smooth . . . . . 10. *striatus*, n. sp.
Vertex striate . . . . . 6. *harpactorinus* (Enderlein)

7. Fore tarsus more than two times as long as fore tibia . . . . . 2. *brasiliensis* (Szépligeti)
Fore tarsus less than two times as long as fore tibia . . . . . 4. *didymus* (Brullé)

1. **Megaloproctus bifasciatus** (Szépligeti)

Megaproctus bifasciatus Szépligeti, 1904, p. 192. Holotype female in Hungarian Natural History Museum, Budapest.

Megaloproctus bifasciatus (Szépligeti); Shenefelt and Marsh, 1976, p. 1319.

Female: Length of body, 12 mm; ovipositor 10 mm. Color: head black, palip yellow, mouth area orange; thorax black, upper part of propleuron, mesopleuron above subalar groove, tegulae and mesonotal lobes orange; abdominal terga 1-5 orange, terga 6-7 black, terga 4 and 5 with black lateral spots; fore leg yellow except last tarsomere black, mid leg yellow except coxa brown and last tarsomere black, hind leg with coxa, trochanter 1, base of trochanger 2, apex of femur, base and apex of tibia, and last 4 tarsomeres black, apex of trochanter 2, rest of femur and tibia, and first tarsomere yellow; wings with two dark cross bands (similar to *didymus*). Head: vertex, frons, and temples smooth, face rugose, rugae running transversely at sides; ocell-ocular distance about two times as long as lateral ocellus; frons slightly depressed, with longitudinal shallow furrow; first flagellomere equal in length to second; longest segment of maxillary palpus equal in length to first flagellomere. Thorax: Pronotum and proepisternum with deep hair sockets giving punctate appearance; subalar groove weakly scrobiculate, sternaulus and mesopleural furrows scrobiculate; propodeum smooth, hair sockets deep, median basal carina long and distinct, areola not margined, short longitudinal carina at base above each spiracle. Abdomen: smooth, first tergum slightly longer than apical width; ovipositor slightly shorter than body. Legs: fore tibia with row of 5 stout spines along anterior edge and 6 spines at apical edge; fore tarsus about 1-1/2 times as long as fore tibia. Wings: recurrent vein of fore wing interstitial with first intercubitus; second segment of radius short, less than two times as long as first segment; nervulus postfurcal by distance greater than its length; radiellen cell of hind wing widening toward apex, with weak cross vein at basal 1/3; first and second segments of mediella about equal in length. (The fore wings each have a vein in the anal cell near the nervulus which angles toward the wing apex. This is not a characteristic vein even for the subfamily and I consider it to be an anomaly.)

Male: Unknown.

Type locality: Marcapata, Peru.

Distribution: Peru. Known only from the holotype.

This species is very similar to *didymus* and *schunckei*. From *didymus* it is separated by the cross vein in the radiellen cell of the hind wing and the yellow hind legs; from *schunckei* it is distinguished by the greater ocell-ocular distance.

2. **Megaloproctus brasiliensis** (Szépligeti) (Figs. 8, 14, 19, 22)

Megaproctus brasiliensis Szépligeti, 1902, p. 59. Holotype female in Hungarian Natural History Museum, Budapest.

Megaproctus peruiensis Szépligeti, 1902, p. 60. Holotype female in Hungarian Natural History Museum, Budapest.

Ectetamenochir crinicornis Enderlein, 1912, p. 34. Holotype female in Polish Academy of Sciences, Warsaw.

Megaloproctus brasiliensis (Szépligeti); Shenefelt and Marsh, 1976, p. 1319.

Female: Length of body, 11-16 mm; ovipositor, 14-25 mm. Color: head and antenna black; thorax varies from entirely orange to entirely black, more often orange with proepisternum black; all coxae, hind trochanter 1 and hind femur black, rest of fore and middle legs yellow except femora which are occasionally light brown, hind tibia and tarsus dark brown to black, apex of hind femur and base of hind tibia occasionally dark yellow, hind coxa occasionally orange on basal 1/3; abdominal terga 1-4 always orange, tergum 7 always black, terga 5-6 varying from black to orange; wings banded but sometimes not distinctly. Head: face finely rugose (Fig. 22), vertex and temples smooth, frons slightly depressed and occasionally rugose and with a scrobiculate median longitudinal groove (Fig. 14); ocell-ocular distance two times length of lateral ocellus; antenna 80-86 segmented, first flagellomere about as long as second; longest segment of maxillary palpus about equal in length to second flagellomere. Thorax: propodeum (Fig. 19) with median basal carina usually distinct, areola indistinctly defined by rugosities. Abdomen (Fig. 19): entirely smooth; basal corners of second tergum depressed; first tergum slightly longer than apical width; ovipositor longer than entire body, 1-1/4 to 1-1/2 times longer. Legs: fore tibia with 4-5 spines along anterior edge, 8-9 spines at apical edge: fore tarsus 2-1/4 times as long as fore tibia. Wings (Fig. 8): recurrent vein entering first cubital cell; nervulus postfurcal by nearly its own length; first segment of mediella usually shorter than second segment.

Male: Essentially as in female except hind femur orange and body length shorter.

Type localities: Massanary, Brazil (*brasiliensis*); Pebas, Peru (*peruiensis*); Obidos, Brazil (*crinicornis*).

Distribution: Venezuela: Mt. Marahuaca. British Guiana: Mazarumi, Kartobo, Tumatumari. Surinam: Para District, Mooi Wane, Zanderij, Mapane, Albina-Moengo, Coppename Bakhius Mts., Poeloegoedoe. French Guiana: Mana River. Peru: Pucallpa, Pebas. Brazil: Massanary, Obidos, Para, Manaos, Rio Autaz.

This species is easily distinguished from the other species with banded wings by its long ovipositor being distinctly longer than entire body.

3. **Megaloproctus castaneus** (Brullé) (Figs 1, 12, 21)

Megaproctus castaneus Brullé, 1846, p. 468. Holotype female in Natural History Museum, Paris.

Megaproctus xanthostigma Szépligeti, 1904, p. 192. Holotype female in Hungarian Natural History Museum, Budapest.

Bracon? ferruginosus Holmgren, 1869 (1868), p. 426. Synonymy by Roman, 1910. Holotype female in Swedish Natural History Museum, Stockholm.

Megaloproctus castaneus (Brullé); Shenefelt and Marsh, 1976, p. 1319.

Female: Length of body, 10-19 mm; ovipositor, 12-20 mm. Color: entire body red-brown except fore and mid legs which are honey yellow; wings dusky brown, stigma and small area below bright yellow. Head: face (Fig. 21) rugose with definite transverse rugae on each side, vertex strigate between lateral ocelli and with a sharp transverse ridge between lateral ocelli so that frons and vertex are nearly at a right angle to each other (Fig. 12); ocell-ocular distance about equal to length of lateral ocellus; antenna 70-75 segmented, first flagellomere shorter and thicker than second, all flagellomeres longer than wide, apical ones not flattened as in *platyantennus*; longest segment of maxillary palpus a little longer than second flagellomere. Thorax: propodeum smooth, without stub of median basal carina. Abdomen: first tergum about as long as apical width, smooth dorsally except for apical lateral corners which are occasionally rugose; terga 2-3 smooth except for some rugosities at base, second tergum with weak converging lines from dorsal corners to suturiform articulation; rest of terga smooth; ovipositor about as long as body, sharply curved downward at tip. Legs: fore tibia with 5-7 spines along anterior edge, 7-8 spines at apical edge; fore tarsus about two times as long as fore tibia; hind femur about 3-1/2 times as long as wide, widest near middle. Wings (Fig. 1): second segment of radius longer than second intercubitus, first cubital cell not as short as in *platyantennus*; recurrent vein entering first cubital cell; nervulus postfurcal by more than its length; first and second segments of mediella and basella about equal in length to each other; radiellen cell noticeably widening at apex.

Male: Essentially as in female.

Type localities: Rio Grande Province, Brazil (*castaneus*); Rio de Janeiro, Brazil (*ferruginosus*); Paraguay (*xanthostigma*).

Distribution: Brazil: Rondon, Cauna, Nova Teutonia, Rio de Janeiro, Blumenau, Rio Grande Province. Paraguay: no locality. Argentina: Tucuman.

This species is similar to *platyantennus* in habitus and color; it can be easily distinguished from *platyantennus* by its normal un-flattened apical antennal segments and strigate vertex.

4. **Megaloproctus didymus** (Brullé) (Figs. 13, 16, 20, 26)

Megaproctus didymus Brullé, 1846, p. 467. Holotype female in Natural History Museum, Paris.

Megaproctus affinis Szépligeti, 1904, p. 192. New synonymy. Holotype female in Hungarian Natural History Museum, Budapest.

Megaproctus unifasciatus Szépligeti, 1906, p. 601. New synonymy. Holotype female in Hungarian Natural History Museum, Budapest.

Megistoproctus marcapatanus Roman, 1924, p. 22. New synonymy. Holotype female in Swedish Natural History Museum, Stockholm.

Megistoproctus autazicus Roman, 1924, p. 23. New synonymy. Lectotype female in Swedish Natural History Museum, Stockholm.

Megaloproctus didymus (Brullé); Shenefelt and Marsh, 1976, p. 1319.

Female: Length of body, 11-13 mm; ovipositor, 9-11 mm. Color: head and antenna black, clypeus dark red; prothorax anterior to propleural groove, apex of scutellum and propodeum black, mesothorax and rest of prothorax orange, mesopleuron rarely with black markings; first and second abdominal terga and base of third orange, rest of terga black; coxae black, trochanter 1 black or yellow, trochanter 2 always yellow, fore femur, tibia and tarsus yellow, mid femur usually yellow, rarely black, mid tibia and tarsus yellow, hind femur, tibia and tarsus black. Head: vertex and temples smooth, face coarsely rugose (Fig. 20), frons smooth, slightly depressed and with shallow median scrobiculate groove (Fig. 13); ocell-ocular distance about 1-1/4 times length of lateral ocellus; antenna 67-74 segmented, first flagellomere slightly longer than second. Thorax: propodeum with distinct strong basal carina and strongly margined areola (Fig. 16); subalar groove usually scrobiculate. Abdomen: entirely smooth; first tergum slightly longer than apical width; second tergum with basal corners depressed; ovipositor shorter than body, slightly longer than abdomen. Legs: Fore tibia with scattered row of 9-13 spines on anterior edge, 8-9 spines at apical edge (Fig. 26); fore tarsus about 1-3/5 times longer than fore tibia, sometimes longer. Wings: recurrent vein entering first cubital cell; nervulus postfurcal by about its own length; first segment of mediella of hind wing slightly shorter than second.

Male: Essentially as in female; fore tibia with single row of 6-8 spines.

Type localities: la Guyane (probably French Guiana) (*didymus*); Marcapata, Peru (*affinis* and *marcapatanus*); Mapiri, Bolivia (*unifasciatus*); Rio Autaz, Brazil (*autazicus*).

Distribution: Trinidad: New York Zoological Society Tropical Research Station. British Guiana: Kartabo, Essequibo River, Demerara River. French Guiana: Mana River. Peru: Marcapata, Yanayacu, Boqueron Abad. Bolivia: Beni, Tumupasa, Mapiri. Brazil: Santarem, Apipica, Coraci, Igarape Gurupi, Campinas, Feija.

This species is similar to *brasiliensis* but distinguished by its shorter ovipositor (shorter than body), shorter fore tarsus (less than twice length of fore tibia), relative lengths of segments of the mediella, and its coarsely rugose face. There is considerable variation in color in the specimens that I have seen with three different types following certain geographical boundaries. However, in view of the variation found in other species, such as *harpactorinus*, and until I have seen more specimens, I prefer not to place these groups into subspecies.

Roman described *autazicus* from one female and four males but did not designate a holotype. I have seen the female and two males from this series and hereby designate the female as lectotype.

5. **Megaloproctus fumipennis** (Szépligeti)

Megaproctus fumipennis Szépligeti, 1904, p. 191. Holotype female in Hungarian Natural History Museum, Budapest.

Megaloproctus fumipennis (Szépligeti); Shenefelt and Marsh, 1976, 1319.

Female: Length of body, 6.5 mm; ovipositor, 4.5 mm. Color: clypeus and malar space orange, rest of head black; antenna black; pro- and mesothorax orange; propodeum black; abdominal terga 1-3 orange, 4-8 black; fore and mid legs orange except base of tibiae black, hind leg black except apex of second trochanter and apex of femur orange; wings uniformly brown. Head: vertex, frons and temples smooth; ocellocular distance shorter than diameter of lateral ocellus; eyes large, temples less than half width of eye; face rugulose; antennae of type broken. Thorax: propodeum with short basal median carina, long narrow pentagonal areola, and lateral longitudinal carinae above each spiracle; rugose inside areola and around spiracles. Abdomen: first tergum as long as apical width, very weakly strigate; ovipositor shorter than body. Legs: fore tibia with 8 spines on anterior edge and 5 spines on apical edge; fore tarsus 1-1/3 times as long as fore tibia. Wings: recurrent vein entering first cubital cell at apex; nervulus postfurcal by slightly less than its length; radiellen cell widening toward apex, divided in basal 1/3 by weak cross vein; first segment of mediella slightly longer than second segment.

Male: Essentially as in female; propodeum orange, proepisternum black.

Type locality: Sicuani, Peru.

Distribution: Peru. In addition to the holotype, I have seen only two males from Peru that are apparently this species. They are labeled as being from Chauchamayo which I could not locate. This locality is probably a misprint for Chauchosmayo River which is very near the type locality of Sicuani.

The distinguishing features of *fumipennis* are its color, sculpture on propodeum, and cross vein in the radiellen cell of the hind wing.

6. **Megaloproctus harpactorinus** (Enderlein) (Figs. 2, 10, 23, 25)

Prosthiacantha harpactorinus Enderlein, 1912, p. 25. Holotype male in Polish Academy of Science, Warsaw.

Megaproctus nigridorsum Enderlein, 1920, p. 137. Holotype female in Polish Academy of Science, Warsaw.

Megistoproctus debilis Roman, 1924, p. 21. Holotype female in British Museum (Natural History), London.

Megistoproctus opaculus Roman, 1924, p. 24. Holotype female in Swedish Natural History Museum, Stockholm.

Megaloproctus harpactorinus (Enderlein); Shenefelt and Marsh, 1976, p. 1320.

Female: Length of body, 10-17 mm; ovipositor, 10-20 mm. Color: head black, malar space and clypeus occasionally orange; antenna black; thorax

varying from entirely orange to entirely black; abdomenal terga 1-3 always orange, terga 7-8 always black, terga 4-6 varying from black to orange; fore and mid legs always yellow except last tarsomere always and coxae occasionally black; hind leg varys from entirely black to yellow except femur always yellow at least at base; wings banded yellow and dark brown, apical half of hind wing occasionally entirely infuscated. Head: vertex strigate between lateral ocelli (Fig. 10), with a transverse ridge between ocelli so that vertex and frons are nearly at right angles to each other; lateral ocelli nearer eyes than to each other, ocellocular distance about 3/4 diameter of lateral ocellus face rugose with definite transverse rugae on each side (Fig. 23), antenna 73-80 segmented, first flagellomere shorter than second; longest segment of maxillary palpus about equal to second flagellomere. Thorax: propodeum with weak longitudinal median carina, areola absent, occasionally area of areola rugulose. Abdomen: entirely smooth; apical corners of first tergum and basal corners of second tergum impressed and occasionally rugulose; first tergum longer than apical width; ovipositor slightly longer than body, curved down at apex. Legs: fore tibia with 5-6 spines on anterior edge, 6-8 on apical edge (Fig. 25); fore tarsus about 1-4/5 times as long as fore tibia; hind femur about 3-3/4 times as long as wide, widest in middle. Wings (Fig. 2): recurrent vein entering extreme apex of first cubital cell, occasionally apparently interstitial with first intercubitus; nervulus postfurcal by at least its own length, occasionally more than its length; radiellen cell gradually widening toward wing apex.

Male: Essentially as in female.

Type localities: Obidos, Brazil (*harpactorinus*); Mucury, Brazil (*nigridorsum*); Brazil, probably Amazonas (*debilis*); Rio Autaz, Brazil (*opaculus*).

Distribution: Brazil: Rio caiary-Uaupes, Santarem, Rio Autaz, Obidos, Mucury. Peru: Pucallpa, Chauchamayo, Huanaco, Yanayacu, Colonia Perene, El Campamiento. British Guiana: Essequibo River. French Guiana: Mana River. Bolivia: Prov. del Sara, Cuatro Ojos, Santa Cruz, Cochabamba. Venezuela: El Tucuco.

This species is quite variable in color and similar in habitus to the other species with banded wings, but it is easily distinguished by the strigate vertex and short ocellocular distance (3/4 diameter at lateral ocellus).

7. **Megaloproctus pertinax** (Cameron), revised status (Fig. 7)

Doryctes pertinax Cameron, 1887, p. 383. Holotype female in British Museum (Natural History), London. Incorrectly synonymized under *Megaloproctus strongylogaster* (Cameron) by Shenefelt and Marsh, 1976, p. 1320.

Megaproctus fuscipennis Szépligeti, 1904, p. 191. Holotype female in Hungarian Natural History Museum, Budapest.

Megistoproctus joachimi Roman, 1924, p. 19. Lectotype female in Swedish Natural History Museum, Stockholm.

Female: Length of body, 9-12 mm; ovipositor, 7-10 mm. Color: head and antenna black; prothorax usually black with upper part of propleuron always orange, occasionally entire prothorax orange; mesothorax orange;

propodeum usually black, occasionally orange; abdominal segments 1-3 always orange, segments 7-8 always black, segments 4-6 usually black but occasionally orange; fore and mid tarsi yellow or light brown, apical tarsomeres black; remainder of fore and mid legs and all of hind legs black; second trochanter of all legs orange at apex; wings dusky black, usually with clear spot in middle of first cubital cell and at junction of first intercubitus, cubitus, and recurrent veins; radiellen cell with curved infuscated spot at base. Head: vertex, frons, and temples smooth, face strongly rugose; teeth of mandibles small, not crossing when closed; ocellocular distance about 1-1/2 times as long as diameter of lateral ocellus; frons slightly depressed, with shallow scrobiculate groove between antennae; first flagellomere longer than second; longest segment of maxillary palpus slightly longer than second flagellomere. Thorax: propodeum smooth except occasionally rugose inside areola and around spiracles, basal median carina and areola not always distinct. Abdomen: first tergum longer than apical width; second tergum with basal corners slightly impressed; third tergum with smooth sinuate transverse groove; entire abdomen smooth dorsally, rarely basal corners of second tergum weakly rugose; ovipositor slightly shorter than body, slightly curved down at apex. Legs: fore tibia with irregular row of 6-9 spines along anterior edge, 7 spines at apical edge; fore tarsi 1-1/2 to 1- 2/3 times as long as fore tibia; hind femur about 3-1/4 times as long as wide, widest in middle. Wings (Fig. 7): recurrent vein entering extreme apex of first cubital cell, rarely interstitial with first intercubitus; nervulus postfurcal by slightly less than its length; greatest length of radial cell about 3-3/4 times its greatest width; radiellen straight to wing margin; radiellen cell with crescent shaped infuscated spot at base.

Male: Similar to female except color of body entirely orange with antennae, tip of abdomen, hind trochanters, and hind tibiae and tarsi brown.

Type localities: Volcan de Chiriqui, Panama (*pertinax*, according to label; description states Bugaba); Marcapata, Peru (*fuscipennis*); Rio Autaz, Brazil (*joachimi*). Roman described *joachimi* from 53 specimens (44 M, 9 F, but did not designate a holotype in his paper although one of the syntypes is labeled, apparently by him, as the holotype. I have selected this specimen as the lectotype. The specimen is a female with the following data: "Rio Autaz," "Amazon *Roman*," "66," "Typus" (red label), "Megistoproctus Joachimi Rom. n.sp. F typ.," "245/70," "290/74," "Riksmuseum Stockholm," "Lectotype Megistoproctus joachimi Roman by P. Marsh 1974."

Distribution: Panama: Volcan de Chriqui (or Bugaba), Barro Colorado Island. French Guiana: Mana River. Peru: Chauchamayo, Puerto Maldonado, Pucallpa, Marcapata, Yanayacu, Boqueron Abad. Brazil: Rio Autaz, Rio Purus, Benjamin Constant.

This species is similar to *fumipennis* but is distinguished by its black legs, smooth propodeum, and lack of cross vein in radiellen cell of hind wing. The infuscated spot in the radiellen cell may appear to be a cross vein but is definitely not associated with any veins in the hind wing. This species also can be confused with *strongylogaster* but is distinguished by the shorter radial cell (less than 4 times its width), smaller size, shorter fore tarsus (less than twice length of fore tarsus) and infuscated spot in the radiellen cell of the hind wing.

8. **Megaloproctus platyantennus**, n. sp. (Figs. 3, 11, 18, 24)

Female: Length of body, 8-14 mm; ovipositor, 8-14 mm. Color: head, thorax, coxae, and abdomen reddish brown; legs honey yellow; antennae brown at base, honey yellow in middle, black apically; wings uniformly dusky, light brown, stigma and small area below bright yellow. Head: face rugose vertex (Fig. 11) smooth between ocelli; lateral ocelli nearer to each other than to eyes, ocellocular distance about 3 times diameter of lateral ocellus; antenna 65-70 segmented, first flagellomere about as long as second, flagellomeres 1 to about 30 longer than wide and not flattened, those from about 30-40 suddenly becoming shorter and flattened, those from 40 to apex of antenna wider than long and very flattened; longest segment of maxillary palpus shorter than second flagellomere. Thorax: pronotum with transverse carina across apex extending onto propleuron; propodeum smooth with short stub of dorsal median carina at base. Abdomen (Fig. 18): first tergum slightly longer than wide, smooth dorsally except for rugose apical lateral corners; terga 2 and 3 with two scrobiculate longitudinal converging furrows and one usually scrobiculate transverse sinuate furrow which set off raised u-shaped median area at base;rest terga smooth; ovipositor about as long as body, straight or only slightly curved down at apex. Legs: fore tibia with 5-7 spines along anterior edge and 5 spines at apical edge; fore tarsus about 2-1/2 times as long as fore tibia; hind femur about 4-1/3 times as long as wide, widest near apex. Wings (Fig. 3): first cubital cell short, second segment of radius not longer than second intercubitus; recurrent vein interstitial with first intercubitus; nervulus postfurcal by less than 1/2 its length; second segment of mediella slightly longer than first segment and basella; radiellen cell not noticeably widening at apex.

Male: Essentially as in female; body length 7-10 mm; apical flagellomeres not flattened.

Holotype: Female, Nova Teutonia, Brazil (27° 11'B, 52° 23'L), 7. II. 1936, Fritz Plaumann. Deposited in the British Museum (Natural History), London. *Paratypes*: Brazil: same data as holotype, dates from September to February, 1937 to 1947, 39 F, 30 M; Rondon (24° 38'B, 54° 07'L), 1 F, 7-IX-52, Fritz Plauman; Passe des Indies (27° 07'B, 52° 36'L), 1 F, 1 M, II-1937, F. Plaumann; Parana, 1 F, 1907-12, E. Dukinfield Jones. Paratypes deposited in U.S. National Museum,British Museum (Natural History), Canadian National Collection and Swedish Museum of Natural History.

This species is similar to *castaneus* in habitus and color but can be readily distinguished by the flattened apical segments of the female antenna, the smooth vertex, and sculpturing of the abdomen. The flattened flagellomeres of *platyantennus* are unique in this genus and, for that matter, in the whole subfamily. I have seen one specimen identified as *castaneus* by Roman which is actually *platyantennus*.

9. **Megaloproctus schunckei** , n. sp. (Figs. 6, 15)

Female: Length of body, 8-11 mm; ovipositor, 7-9 mm. Color: head and antenna black, prothorax black except upper part of propleuron which is orange, mesothorax orange; propodeum usually black, occasionally orange dorsally; abdominal terga 1-6 orange, tergum 7 black, terga 5-6 sometimes marked with black at apex; fore legs yellow, fore coxae sometimes brown;

mid leg yellow except coxa which are black; hind coxa and trochanters black, hind femur yellow, hind tibia usually black, sometimes yellow on basal half, hind tarsus black; wings banded. Head: vertex and temples smooth (Fig. 15), face coarsely rugose, transversely so at sides, frons depressed, smooth, with shallow longitudinal line between antennae; ocellocular distance less than diameter of lateral ocellus; eyes large, malar space about 1/5 eye height, temples less than 1/2 eye width; antennae broken in all specimens, first and second flagellomeres about equal in length. Thorax: carinae on propodeum weak, sometimes obscured, areola often a raised rugose area, costulae absent. Abdomen: entirely smooth, first tergum longer than apical width; ovipositor slightly shorter than body, curved down at apex. Legs: fore tibia with row of 5-8 spines along anterior edge, 5-6 spines at apical edge; fore tarsus 1-1/2 times as long as fore tibia. Wings (Fig. 6): recurrent vein nearly interstitial with first intercubitus; nervulus postfurcal by two times its length; first segment of mediella longer than second segment; radiellen cell widening toward wing apex, with weak cross vein across basal 1/3.

Male: Unknown.

Holotype: Female, Pucallpa, Dept. Loreto, Peru, 29. IV. 1952, J. M. Schuncke. Deposited in British Museum (Natural History), London. *Paratypes*: 2 F, same data as holotype except dates of 8. V. 1952. Deposited in U.S. National Museum.

This species is similar to *striatus* but differs in the smooth abdomen and the weaker carinae on the propodeum.

10. **Megaloproctus striatus** , n. sp. (Figs. 4, 9, 17)

Female: Length of body, 8-11 mm; ovipositor, 6-9 mm. Color: head and antennae black; pro- and mesothorax black, propodeum black or orange; abdominal terga 1-6 orange, tergum 7 at least black on apical half; fore and mid legs yellow, mid coxa sometimes brown, hind coxa black, hind trochanters, femora and basal half of tibia yellow, apical half of tibia and tarsus brown or black; wings banded. Head: vertex and temples smooth (Fig. 9), face coarsely rugose, frons depressed, smooth; ocellocular line shorter than diameter of lateral ocellus; eyes large, malar space about 1/6 eye height, temples less than 1/2 eye width; antennae broken in all specimens, first and second flagellomeres equal in length. Thorax: basal carina of propodeum (Fig. 17) distinct but often obscured by rugosities, areola margined and rugose, costulae present, second longitudinal carina present above spiracles. Abdomen (Fig. 17): first tergum strigate-rugose laterally, basal half of second tergum longitudinally strigate, rest of terga smooth; first tergum longer than wide; ovipositor slightly shorter than body, curved down at apex. Legs: fore tibia with row of 5-7 spines along anterior edge, 5-7 at apical edge; fore tarsus about 1-1/3 times as long as fore tibia. Wings (Fig. 4): recurrent vein nearly interstitial with first intercubitus; nervulus postfurcal by twice its length; radiellen cell widening toward wing apex, with a weak cross vein at basal 1/3; first segment of mediellen longer than second segment.

Male: Essentially as in female; thorax entirely orange except prothorax black.

Holotype: Female. Braganza, Para, Brazil, H. B. Merrill colr. Deposited in U.S. National Museum, Washington. *Paratypes:* Paraguay:

San Bernardino, 1 F, K. Fiebrig. Brazil: Corumba, 2 F. Venezuela, 1 F, Paraitepuy, Bolivar, P. J. Andaze, Dec. 1940. Peru, 1 F, 1 M, Loreto, Pucallpa, 13-VII-1951 and 24-I-1952, J. M. Schuncke. Deposited in U.S. National Museum, British Museum (Natural History), Canadian National Collection, and Cornell University.

This species is similar to *bifasciatus* and *schunckei*, but can be distinguished from *bifasciatus* by the shorter ocellocular distance and strigate abdominal terga, and from *schunckei* by the strigate abdominal terga. It is also the only species in the genus which has the costulae on the propodeum clearly indicated. The two specimens from Brazil have a cross vein in the anal cell of the fore wing similar to the holotype of *bifasciatus* but I consider this also to be an anomaly.

11. **Megaloproctus strongylogaster** (Cameron) (Fig. 5)

Doryctes strongylogaster Cameron, 1887, p. 382. Holotype female in British Museum (Natural History), London.

Megaloproctus strongylogaster (Cameron); Shenefelt and Marsh, 1976, p. 1320.

Female: Length of body, 12-14 mm; ovipositor, 11-14 mm. Color: upper part of propleuron, mesothorax, abdominal segments 1-3 and apex of second trochanter orange; propodeum orange or black; rest of body and legs black; wings evenly infuscated, not banded. Head: vertex, frons, and temples smooth; ocellocular distance about 1-2/3 times diameter of lateral ocellus; frons slightly depressed, with shallow scrobiculate groove between antennae; face rugose, transversely so at sides; teeth of mandible large, crossing when closed, second tooth large and truncate, longest segment of maxillary palpus longer than second flagellomere. Thorax: subalar groove scrobiculate; propodeum smooth except weakly rugose inside areola, basal median carina strong, areola distinctly margined. Abdomen: mostly smooth, first tergum and basal corners of second tergum weakly strigate in holotype; first tergum longer than apical width; apical corners of first tergum and basal corners of second tergum depressed; second tergum with transverse groove across middle; ovipositor about as long as body, slightly curved down at apex. Legs: fore tibia with scattered row of 7-9 spines along anterior edge, 7 spines at apical edge; fore tarsus about twice as long as fore tibia; hind femur about 3-1/2 times as long as wide. Wings (Fig. 5): recurrent vein entering first cubital cell; nervulus postfurcal by slightly more than its length; length of radial cell nearly five times its greatest width; radiellen vein straight to wing margin, radiellen cell uniformly infuscated.

Male: Unknown.

Type locality: Bugaba, Panama.

Distribution: Brazil: Coraci. Peru: Rio Santiago, Surinam: Mapane.

This species is very similar to *pertinax* but can be separated by its longer radial cell (nearly 5 times width) and longer fore tarsus (about 2 times length of fore tibia). From *fumipennis* it can be distinguished by the absence of a cross vein in the radiellen cell of the hind wing.

12. **Megaloproctus townesi**, n. sp.

Female: Length of body, 16-19 mm; ovipositor, 22-28 mm. Color: body black except propleuron, entire mesothorax, basal abdominal sterna, lateral longitudinal lines on abdominal tergum 2, and apex of second trochanter which are bright orange; wings very dark brown with clear spots in center of first cubital cell and at junction of cubital, first intercubitus, and recurrent veins. Head: somewhat transverse, vertex in anterior view considerably higher than upper level of eyes; antennae broken, first flagellomere longer than second; longest segment of maxillary palpus longer than second flagellomere; vertex smooth; ocellocular distance about twice as long as diameter of lateral ocellus. Thorax: propodeum with strong basal median carina and two short lateral basal carinae, areola not margined by carinae but indicated by pattern of rugae. Abdomen: first tergum longer than apical width, smooth except few rugae at base and apical corners; second tergum smooth with basal lateral corners impressed and rugose; remainder of terga smooth; ovipositor longer than body. Legs: Fore tibia with double row of 8-12 spines on anterior edge and 7 spines on apical edge; fore tarsus 2-1/2 times as long as fore tibia; hind femur 4 times as long as wide, widest in middle. Wings: recurrent vein entering extreme apex of first cubital cell; nervulus postfurcal by more than its length; radiella suddenly curved down at apex.

Male: Unknown.

Holotype: Female, Pucallpa, Loreto, Peru, Feb. 20, 1962, J. M. Schunke. Deposited in British Museum (Natural History), London. *Paratype*: One female with same data as holotype but dated Dec. 21, 1959. Deposited in U.S. National Museum.

This striking species is easily recognized by its large size, long ovipositor (nearly 1-1/2 times longer than body), and color which is largely black. I take great pleasure in naming this species after my good friend and colleague, Henry Townes.

13. **Megaloproctus xanthus**, n. sp.

Female: Length of body, 10 mm; ovipositor, 7 mm. Color: head and antenna black; proepisternum black, rest of thorax yellow orange; abdomen yellow orange; fore legs black except apex of second trochanter and tarsomeres 1-4 yellow orange, mid leg black except apex of second trochanter and base of basitarsomere yellow orange; hind legs black except coxae, apex of second trochanter and base of basitarsomere yellow orange; wings dusky brownish yellow. Head: vertex smooth; ocellocular distance 1-3/4 times as long as diameter of lateral ocellus; antenna 65 segmented, first flagellomere equal in length to second; longest segment of maxillary palpus longer than second flagellomere. Thorax: propodeum with short median basal carina, long narrow triangle-shaped areola, and lateral carinae above each spiracle, rugose around spiracles and inside areola. Abdomen: first tergum as long as apical width, strigate except medially at base; second tergum strigate, suturiform atriculation scrobiculate; rest of terga smooth; ovipositor shorter the length of body, curved down at apex. Legs: fore tibia with 6 spines along anterior edge, 7 spines at apical edge; fore tarsus 1-1/2 times as long as fore tibia; hind femur 3-1/3 times as long as wide, widest in middle.

Wings: recurrent vein distinctly entering first cubital cell at apex; nervulus postfurcal by 3/4 its length; radiella straight to wing margin.

Male: Unknown.

Holotype: Female. Turrialba, Costa Rica, June 23, 1948, Franz Shrader. Deposited in U.S. National Museum, Washington.

This species is easily distinguished by its entirely yellow orange thorax and abdomen and by the strigate abdominal terga 1-3.

REFERENCES

Brullé, A. 1846. *In* Lepeletier, Histoire naturelle des insectes: Hyménoptères. Paris, Roret vol. 4, 689 pp.

Cameron, P. 1887. Family Braconidae. *In* Biologia Centrali-Americana. Insecta Hymenoptera 1: 312-419.

Enderlein, G. 1912. Zur Kenntnis der Spathiinen und einiger verwandter Gruppen. Arch. Natugesch. 78(A)(2): 1-37.

Enderlein, G. 1920. Zur Kanntnis aussereuropäischer Braconiden. Arch. Naturgesch. 84(A)(11): 51-224.

Fischer, M. 1980. Zur Taxonomie der Gattungen *Hybodoryctes* Szépligeti und *Megaloproctus* Schulz (Hymenoptera, Braconidae, Doryctinae). Sitzungsberich. Österr. Akad. Wissensch. Mathem.-naturw. Kl. Sec. I, Vol. 189, No. 1-3: 1-28.

Harris, R. A. 1979. A glossary of surface sculpturing. Occ. Papers, Calf. Dept. Food and Agric. No. 28, 31 pp.

Holmgren, A. E. 1869 (1868). *In* Konglia Svenska Fregatten Eugenies Resa omkring Jorden. Vetenskapliga Iakttagelser, ii Zoologi; 1, Insects, Haft 12 Hymenoptera, pp. 391-442.

Roman, A. 1910. Notizen zur Schlupfwespensammlung des schwedischen Reichsmuseums. Ent. Tidskr. 31: 109-196.

Roman, A. 1924. Wissenschaftliche Ergebnisse der schwedischen entomologischen Reise des Herrn Dr, A. Roman in Amazonas 1914-15, 10. Hymenoptera: Braconidae, Cyclostomi pro p. Ark. Zool. 16: 1-40.

Schoenherr, C. J. 1838. Gen. et Spec. Curc. 4(2): 868. Roret, Paris.

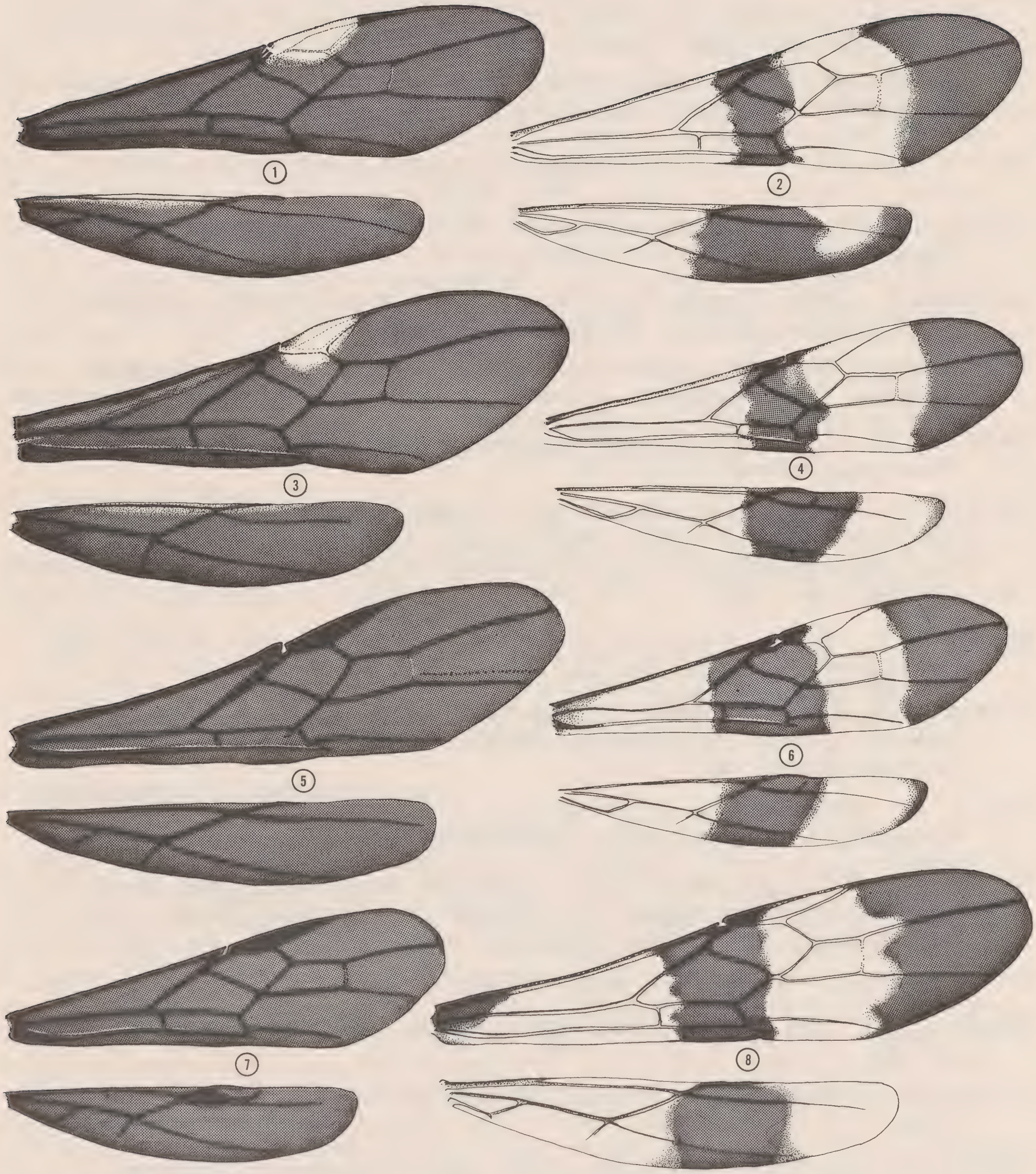
Schulz, A. A. 1906. Spolia Hymenopterologica. Paderborn, Jungfermann, 356 pp.

Schulz, W. A. 1911 (1909). Zweihundert alte Hymenopteran. Zool. Ann. 4: 1-220.

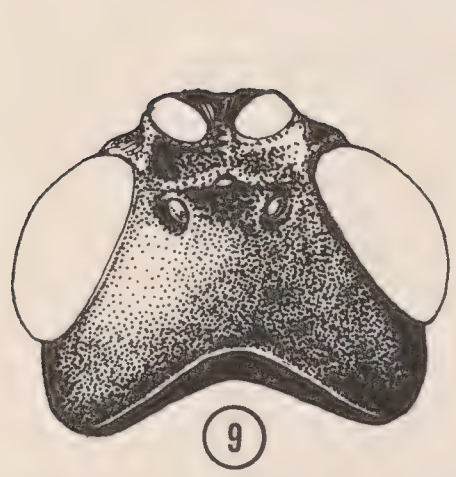
Shenefelt, R. D. and P. M. Marsh. 1976. Hymenopterorum Catalogus, Part 13, pp. 1264-1424: Braconidae Part 9, Doryctinae. W. Junk, The Hague.

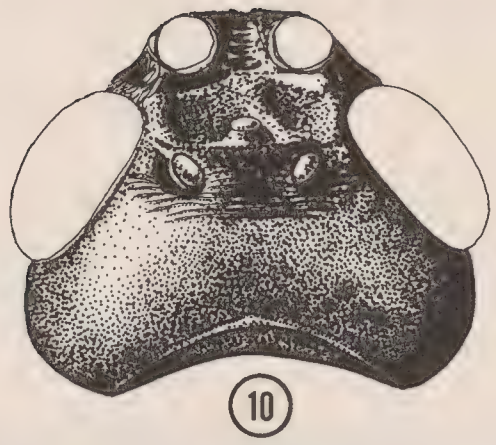
Szépligeti, G. V. 1902. Tropische Cenocoeliden und Braconiden aus der Sammlung des Ungarischen National-Museums. Term. Fuz. 25: 39-84.

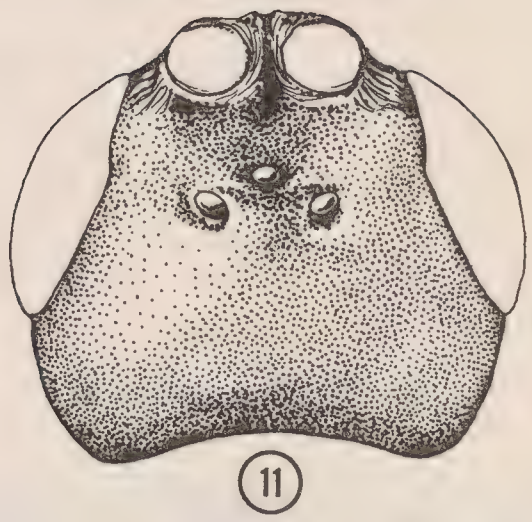
Szépligeti, G. V. 1904. Sudamerikanische Braconiden. Ann. Mus. Natl. Hung. 2: 173-197.

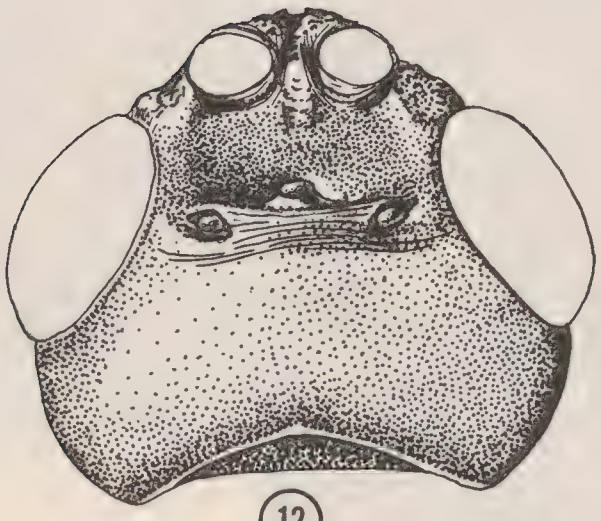


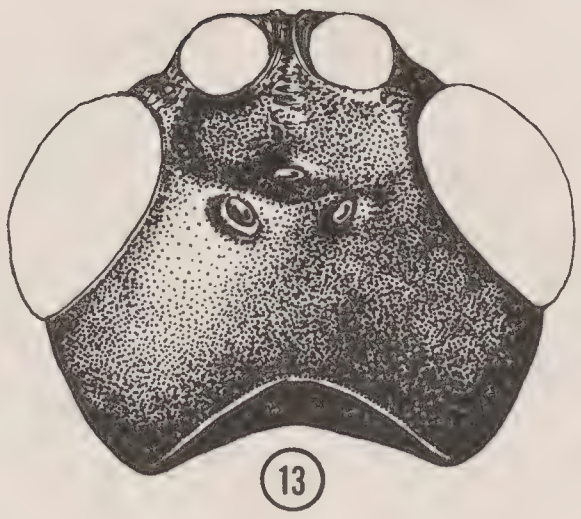
Figs. 1–8. Wings of **Megaloproctus** species: 1, **castaneus** (Br.). 2, **harpactorinus** (End.). 3, **platyantennus**, n. sp. 4, **striatus**, n. sp. 5, **strongylogaster** (Cam.). 6, **schunckei**, n. sp. 7, **pertinax** (Cam.). 8, **brasiliensis** (Szép.).


9

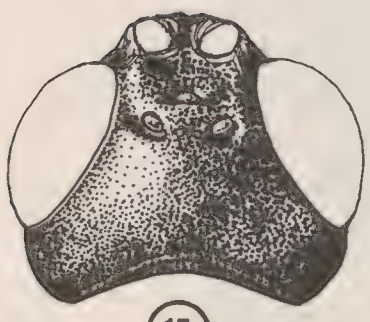

10

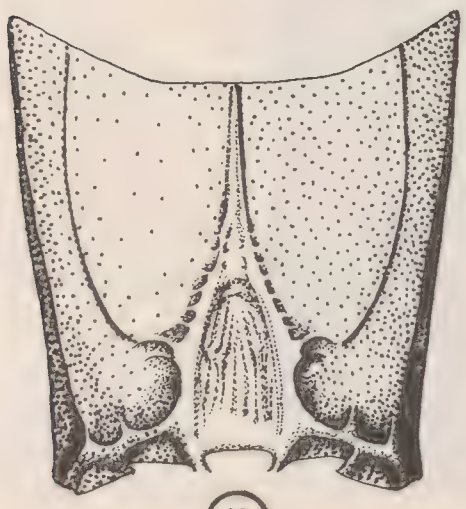

11

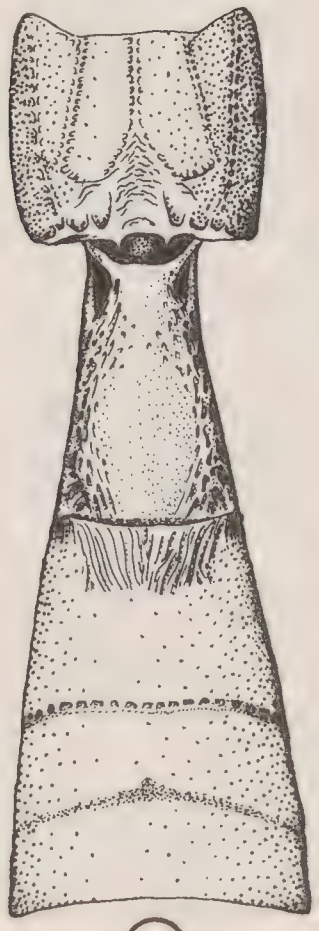

12


13


14


15


16


17


18

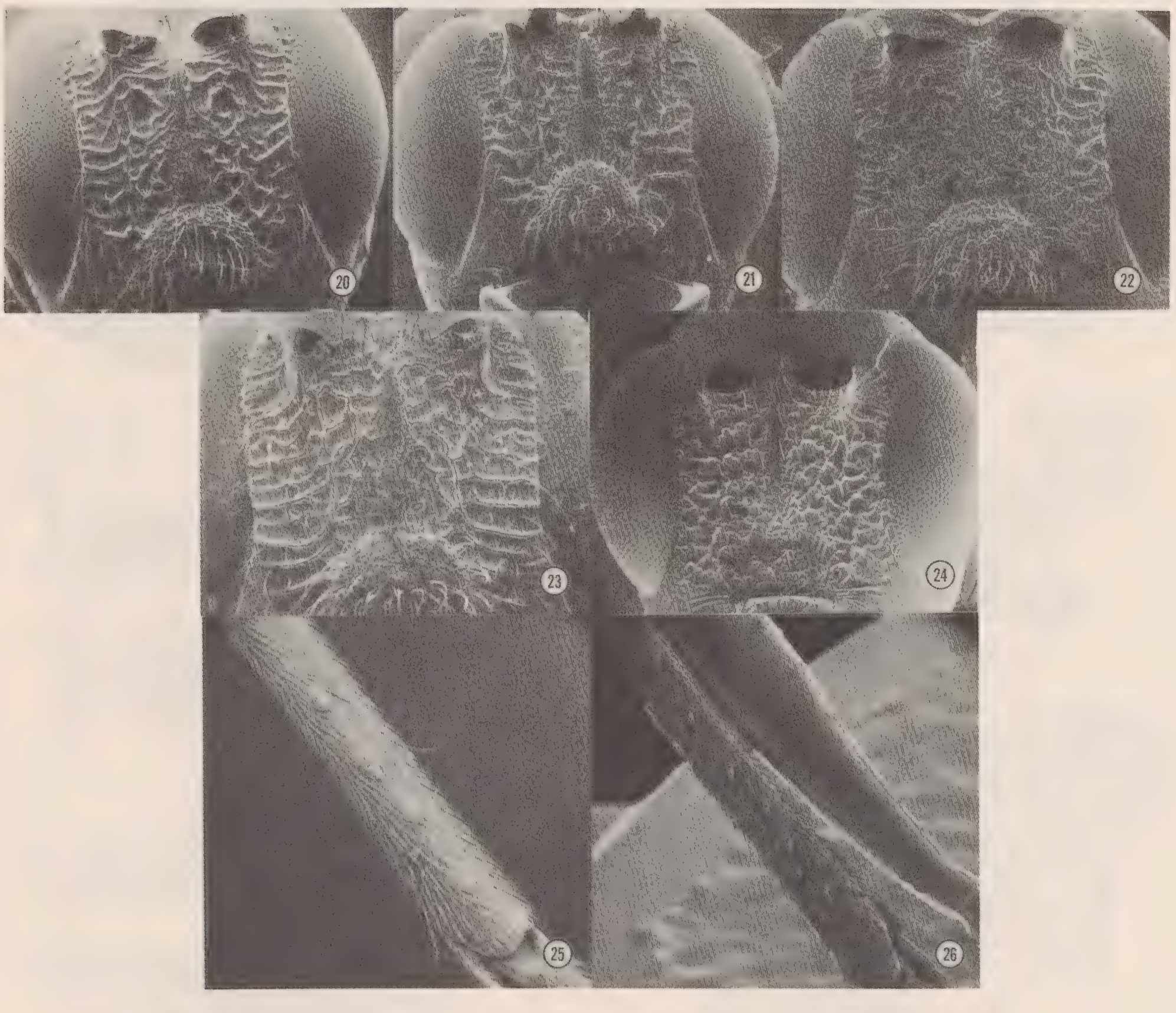

19

Figs. 9-15. Head, dorsal view, of **Megaloproctus** species: 9, **striatus,** n. sp. 10, **harpactorinus** (End.). 11, **platyantennus**, n. sp. 12, **castaneus** (Br.). 13, **didymus** (Br.). 14, **brasiliensis** (Szep.). 15, **schunckei**, n. sp.

Figs. 16-19. Propodeum and abdomen of **Megaloproctus** species: 16, **didymus** (Br.). 17, **striatus**, n. sp. 18, **platyantennus**, n. sp. 19, **brasiliensis.**

Szépligeti, G. V. 1906. Braconiden aus der Sammlung des Ungarischen National Museums, I. Ann. Mus. Natl. Hung. 4: 547-618.

Viereck, H. L. 1914. Type species of the genera of ichneumon flies. Bull. U.S. Natl. Mus. 38: 1-186.



Figs. 20-24. Face of **Megaloproctus** species: 20, **didymus** (Br.). 21, **castaneus** (Br.). 22, **brasiliensis** (Szep.). 23, **harpactorinus** End.). 24, **platyantennus**, n. sp/

Figs. 25-26. Fore tibia of **Megaloproctus** species: 25, **harpactorinus** (End.). 26, **didymus** (Br.).